ods of the calculus is found in the *yenri,* or circle principle, which tradition states was devised by Seki Kowa.

This work should appeal to a wide circle of readers, to the students of the history of science, to all interested in Japanese civilization and even to the general reader, for much of the work is non-technical. Certainly this book will contribute to a juster and broader appreciation of the Japanese genius.

<div align="right">Louis C. Karpinski</div>

University of Michigan

The Development of Mathematics in China and Japan; Abhandlungen zur Geschichte der mathematischen Wissenschaften, Vol. XXX. By Yoshio Mikami. Teubner, Leipzig, 1913. G. E. Stechert and Co., New York. Pp. x + 347.

The activity of Mr. Mikami in making the mathematics of China and Japan known to the western world is highly to be commended. Besides many articles dealing with particular problems of the history of mathematics, Mr. Mikami has an earlier work, "Mathematical Papers from the Far East," in the same series as this volume under discussion, and also another book jointly with Professor David Eugene Smith, "A History of Japanese Mathematics," published by The Open Court Publishing Company. The more active cooperation of some English-speaking historian of mathematics would have been desirable in the two volumes which were published in Germany. Professor G. B. Halsted has, indeed, prefatory notes in the volumes which imply that the task of correcting the English was entrusted to him, but the literary charm of Professor Halsted's own works is lacking here, and even unintelligible as well as non-idiomatic English mars the excellence of these works. Errors are too numerous to be listed.

The book is divided into two parts: the first 21 chapters discuss the Chinese mathematics, and the following 26 chapters the Japanese. Three chapters which are of great value to the student of the history of science are entitled, A General View of the Japanese Mathematics, A Chronology of the Japanese Mathe-

matics, and A Short Notice of the Historical Studies of the Japanese Mathematics. Somewhat similar treatment of the Chinese portion would have added much to the value of the work. An omission in the bibliography of the historical works is Souciet (Père), *Observations mathématiques, astronomiques, etc., tirées des anciens livres Chinois, ou faites nouvellement aux Indes et a la Chine par les pères de la Comp. de Jesus* (Paris, 1729), to which my attention has been called by Professor W. W. Beman.

Considerable uncertainty attaches to the dating, and even the content, of the ancient Chinese and Japanese mathematical treatises, but this, we may say, seems somewhat characteristic of our knowledge of the early Orient, particularly India. An evidence of this uncertainty is the fact that Mikami's description of the early "Arithmetic in Nine Sections" is quite different (footnote, p. 10) from that given by T. Hayashi in his "Brief History of Japanese Mathematics" which appeared in the *Nieuw Archief,* Tweede Reeks, Deel VI. (not accessible to me).

To the student of mathematics the most striking feature of this history will doubtless be the processes of solution of equations of higher degree than the second, by means of the *sangis* or calculating pieces. These solutions require a great amount of detail and approach closely the methods of Horner and Newton. The attention paid to the "squaring of the circle" is of interest, and the approach to a determinant notation is truly striking. The student of the history of mathematics will doubtless be most impressed by the description of the early Chinese process of multiplication of an integer of several places by an integer of the same kind, for the process corresponds in many details to the methods taught in the early works on the Hindu art of reckoning.

Some allowance for the enthusiasm of a Japanese writer must be made by the reader. However, to compare the Japanese Seki with Newton, "If Seki did not surpass Newton in his achievements, yet he was no inferior of the two," is quite beyond the bounds of allowable enthusiasm, for no evidence is presented

which in the least warrants this surprising statement.

In the present state of European civilization we turn with more interest possibly than formerly to these ancient civilizations of the East. English people can only regret that when the Japanese have taken the pains to write in the English language treatises of this kind about their history that even then the publication should be effected in Germany and Holland. Surely the people of the Orient should be met by English and Americans more cordially in scholarly as well as commercial matters. Mr. Mikami has rendered a real service to the history of science by this exposition of the development of mathematics in China and Japan.

<div align="right">Louis C. Karpinski</div>
University of Michigan

Birds of New York. By Elon Howard Eaton. Memoir 12, New York State Museum, John M. Clarke, Director. Part 2. Introductory Chapters; Land Birds. Albany, University of the State of New York. 1914. 4to. Pp. 719. Sixty-four colored plates, and many half-tone illustrations in the text.

In the review of Part I.[1] it was said that " Of the many manuals and reports on birds issued under authority of the various state governments none approaches in voluminous detail and fullness of illustration the present work on the 'Birds of New York,' " of which Part I., comprising the water birds and game birds, appeared in 1910. It was further stated that " the author, Elon Howard Eaton, has shown himself well fitted for the task, both the introductory matter and the systematic part giving evidence of thorough research and good judgment." This high praise is equally merited by Part II., comprising introductory chapters on bird ecology (pp. 5–46), the economic value of birds (pp. 46–51), the status of our bird laws (pp. 51–52), special measures for increasing bird life (pp. 52–58), bird refuges (pp. 58–59), private preserves (pp. 58–60), and a systematic account of the land birds (pp. 61–543).

[1] Science, N. S., Vol. XXXII., No. 866, pp. 247–48, August 19, 1910.

The chapter on bird ecology treats (1) of the fundamental factors of environment, as climatic, physiographic, character of soil, and biotic; (2) bird habits; (3) nesting sites of New York birds, in respect to whether in banks, on the ground, in tussocks, in thickets, at different elevations in trees, or in structures erected by man, including bird boxes specially provided by man; (4) bird communities, classified with reference to breeding haunts; (5) succession of bird life, with reference to climatic and edaphic conditions; (6) the influence of culture conditions, as timber cutting, draining of swamps and marshes, pruning of shade and fruit trees, and effects of agriculture; (7) birds in relation to their food habits; (8) injury done by birds, in different ways by particular species; (9) economic value of birds, as destroyers of insects, weed seeds, field mice, etc.; and, finally (10) measures for increasing bird life, as the erection of artificial nesting sites, and the planting of trees and shrubs that yield them shelter or food.

The systematic part treats of the genera and species in the sequence of the A. O. U. Check-list, from the vultures to the bluebird, in the detailed manner indicated in the review of Part I. The 65 half-tone illustrations in the text are mostly of young birds or of nests and eggs, but include a few full-length views of birds from mounted specimens; the 64 colored plates are by Fuertes, and thus scarcely need further comment, except to say that the color-printing is of very unequal merit, being for the most part good, but far from satisfactory in many of the sparrow plates and in some others, which, of course, is not the fault of the artist. The subject-matter does great credit to the author and to the state, and the work will always be the standard authority on the ornithology of New York as known at the time of its publication. As a piece of book-making it falls far short of being a model. There is no table of contents beyond the chapter titles given on the title-pages, nor any list of the text illustrations, nor of the plates; the index is placed after the plates with a hiatus in the pagination